

FLAT PAK I/O MODULES

Features

- ▶ Industry-standard plug-in modules
- ▶ 4000 VAC optical isolation
- ▶ Input modules handle both AC and DC inputs
- ▶ AC output module has zero voltage turn-on, zero current turn-off
- ▶ UL and CSA recognized; RoHS lead-free; CE low voltage and EMC



Flat Pak I/O Modules

DESCRIPTION

Flat Pak I/O modules include AC and DC input and output modules. All are industry-standard, plug-in modules with 4000 volts of optical isolation between the field side and the logic side, and all are recognized by UL and CSA.

Because of their low profile, Flat Pak modules are ideal for user-designed printed circuit boards where the standard single-channel or Quad Pak modules do not provide an exact fit.

AC/DC Input Modules

Flat Pak input modules handle either alternating current (AC) or direct current (DC). These modules are used for sensing ON/OFF voltage levels. All Flat Pak input modules are designed with filtering on the input and a hysteresis amplifier for high noise rejection and transient free "clean" switching. Each module provides up to 4000 V of optical isolation between field inputs and the logic side of the circuit.

Typical uses and applications include sensing the presence or absence of voltage from sources such as:

- Proximity switches
- Limit switches
- Selector switches
- Push-button and toggle switches
- Thermostats
- Photoelectric switches
- TTL-compatible devices

AC Output Module

The OAC5P Flat Pak output module is used for controlling or switching AC loads. It is equivalent to a single-pole, single-throw, normally open contact (FORM A, SPST-NO, Make). The OAC5P features zero voltage turn-on and zero current turn-off.

Typical uses and applications for the OAC5P include switching the following loads:

- Relays
- Solenoids and contactors
- Motor starters
- Heaters
- Lamps or indicators

DC Output Module

The ODC5P Flat Pak output module is used for controlling or switching DC loads. Typical uses and applications for the ODC5P include switching the following loads:

- DC relays
- DC solenoids
- DC motor starters
- DC lamps or indicators

Part Numbers

Part	Description
IAC5P	Flat Pak input module, 90–140 VAC/VDC
IDC5P	Flat Pak input module, 10–32 VDC or 12–32 VAC
OAC5P	Flat Pak output module, 12–140 VAC
ODC5P	Flat Pak output module, 5–60 VDC

SPECIFICATIONS—AC/DC INPUT MODULES

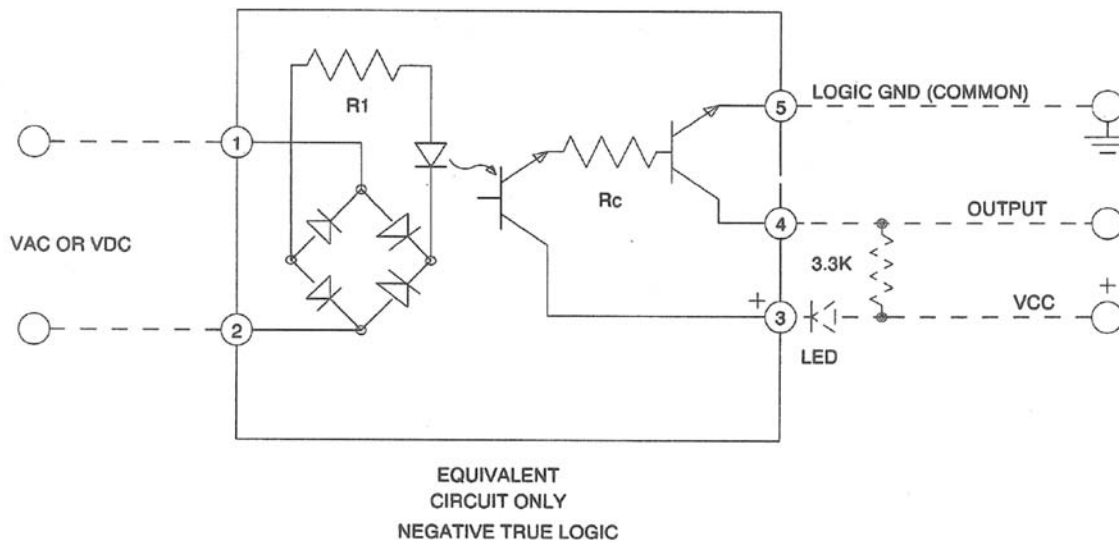
	IAC5P	IDC5P
Input Voltage Range	90–140 VAC or VDC	10–32 VDC or 12–32 VAC
Input Current at Maximum Line	11 mA	25 mA
Turn-on Time	20 ms	5 ms
Turn-off Time	20 ms	5 ms
Input Allowed for No Output	3 mA, 45 V	1 mA, 3 V
Logic Supply Voltage, Nominal	5 VDC	5 VDC
Logic Supply Voltage Range	4.5–6.0 VDC	4.5–6.0 VDC
Logic Supply Current at Nominal Logic Voltage	12 mA	12 mA
Input Resistance (R1 in Schematic Diagram)	14,000 Ohms	1500 Ohms
Control Resistance (Rc in Schematic Diagram)	220 Ohms	220 Ohms
Optical Isolation, Input-to-output	4000 Vrms	4000 Vrms
Output Voltage Drop	0.4 V @ 50 mA	0.4 V @ 50 mA
Output Current	50 mA	50 mA
Output Leakage with No Input	100 μ A maximum @ 30 VDC	100 μ A maximum @ 30 VDC
Operating Temperature	–30 to 70 °C	–30 to 70 °C
Agency Approvals	UL, CE, CSA, RoHS; UKCA	UL, CE, CSA, RoHS; UKCA
Warranty	Lifetime	Lifetime

SPECIFICATIONS—AC AND DC OUTPUT MODULES

	OAC5P	ODC5P
Operating Voltage Range	12–140 VAC	5–60 VDC
Line Voltage, Nominal	120 VAC	n/a
Current Rating	3 A @ 45 °C ambient 2 A @ 70 °C ambient	3 A @ 45 °C ambient 2 A @ 70 °C ambient
Off-state Leakage at Maximum Voltage	5 mA, rms	1 mA
Logic Voltage, Nominal	5 VDC	5 VDC
Logic Voltage Range (Vcc)	2.5–8 VDC	2.5–8 VDC
Logic Pickup Voltage	2.55 VDC	2.5 VDC
Logic Dropout Voltage	1 VDC	1 VDC
Logic Input Current at Normal Logic Voltage (I _{out} in Schematic Diagram)	12 mA	12 mA
Control Resistance (R _c in Schematic Diagram)	220 Ohms	220 Ohms
One-second Surge	n/a	5 A
One-cycle Surge	80 A peak	n/a
Peak Repetitive Voltage	500 V	n/a
Minimum Load Current	20 mA	n/a
Operating Frequency	25–65 Hz	n/a
Turn-on Time	1/2 cycle maximum, zero voltage	100 microseconds
Turn-off Time	1/2 cycle maximum, zero current	750 microseconds
DV/DT, Off-state	200 V/microsecond	n/a
DV/DT, Commutating	Snubbed for rated 0.5 power factor load	n/a
Output Voltage Drop Maximum Peak	1.6 V	1.6 V
Operating Temperature	–30 to 70 °C	–30 to 70 °C
Agency Approvals	UL, CE, CSA, RoHS; UKCA	UL, CE, CSA, RoHS; UKCA
Warranty	Lifetime	Lifetime

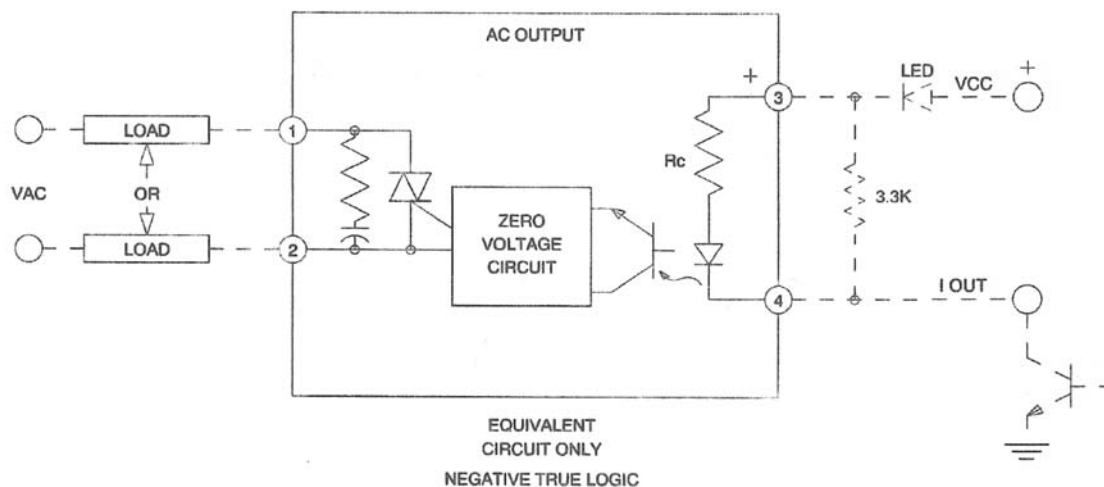
SCHEMATIC—INPUT MODULES

AC/DC Inputs (IAC5P and IDC5P)

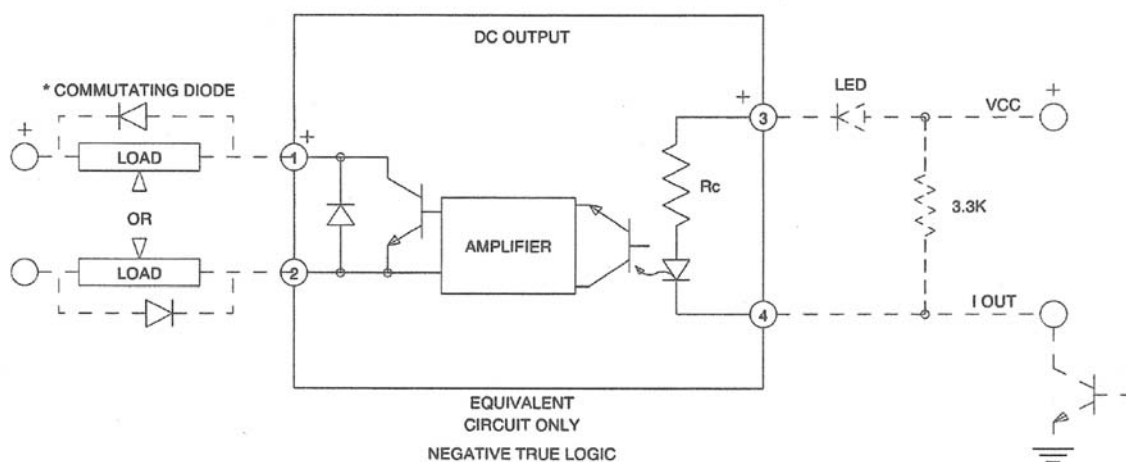


SCHEMATICS—OUTPUT MODULES

AC Output (OAC5P)



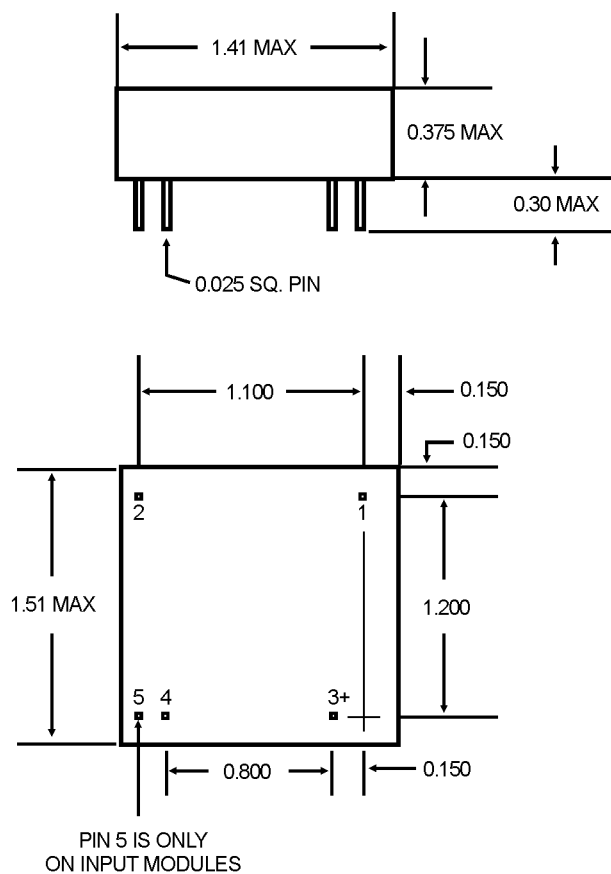
DC Output (ODC5P)



* Must be used on inductive loads.

Note: Also compatible with Totem Pole or 3-State Output.

DIMENSIONAL DRAWING—ALL FLAT PAK MODULES



PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products. Industrial automation, process control, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov RIO®

[groov RIO edge I/O](#) offers a single, compact, PoE-powered industrial package with web-based configuration and IIoT software built in, support for multiple OT and IT protocols, and security features like a device firewall, data encryption, and user account control.

Standing alone, [groov RIO](#) connects to sensors, equipment, and legacy systems, collecting and securely publishing data from field to cloud. Choose a universal I/O model with thousands of possible field I/O configurations, with or without Ignition from Inductive Automation®, or a [RIO EMU energy monitoring unit](#) that reports 64 energy data values from 3-phase loads up to 600 VAC, Delta or Wye.

You can also use [groov RIO](#) with a Modbus/TCP master or as remote I/O for a [groov EPIC](#) system.

groov EPIC® System

Opto 22's [groov Edge Programmable Industrial Controller \(EPIC\) system](#) gives you industrially hardened control with a flexible Linux®-based processor with gateway functions, guaranteed-for-life I/O, and software for your automation and IIoT applications.

groov EPIC Processor

The heart of the system is the [groov EPIC](#) processor. It handles a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

In addition, the EPIC provides secure data communications among physical assets, control systems, software applications, and online services, both on premises and in the cloud. No industrial PC needed.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution color touchscreen. Authorized users can manage the system locally on the touchscreen, on a monitor connected via the HDMI or USB ports, or on a PC or mobile device with a web browser.

groov EPIC I/O

[groov I/O](#) connects locally to sensors and equipment. Modules have a spring-clamp terminal strip, integrated wireway, swing-away cover, and LEDs indicating module health and discrete channel status. [groov I/O](#) is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Software

The [groov EPIC](#) processor comes ready to run the software you need:

- Programming: Choose flowchart-based PAC Control, CODESYS Development System for IEC61131-3 compliant programs, or secure shell access (SSH) to the Linux OS for custom applications
- Node-RED for creating simple IIoT logic flows from pre-built nodes
- Efficient MQTT data communications with string or Sparkplug data formats
- HMI: [groov View](#) to build your own HMI viewable on touchscreen, PCs, and mobile devices; PAC Display for a Windows HMI; Node-RED dashboard UI
- Ignition or Ignition Edge® from Inductive Automation (requires license purchase) with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications



Older products

From solid state relays, to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and working hard at thousands of installations worldwide. You can count on us for the reliability and service you expect, now and in the future.

QUALITY

Founded in 1974, Opto 22 has established a worldwide reputation for high-quality products. All are made in the U.S.A. at our manufacturing facility in Temecula, California.

Because we test each product twice before it leaves our factory rather than testing a sample of each batch, we can afford to guarantee most solid-state relays and optically isolated I/O modules for life.

FREE PRODUCT SUPPORT

Opto 22's California-based Product Support Group offers free technical support for Opto 22 products from engineers with decades of training and experience. Support is available in English and Spanish by phone or email, Monday–Friday, 7 a.m. to 5 p.m. PST.

Support is always available on our website, including [free online training](#) at OptoU, how-to [videos](#), [user's guides](#), the Opto 22 KnowledgeBase, and [OptoForums](#).

PURCHASING OPTO 22 PRODUCTS

Opto 22 products are sold directly and through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at **800-321-6786** (toll-free in the U.S. and Canada) or **+1-951-695-3000**, or visit our website at www.opto22.com.